



Serial No. 09/591,531

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: L.B. Kool et al.

: Group Art Unit: 2825

Serial No.: 09/591,531

: Examiner: I.U. Anya

Filed: June 9, 2000

: Response to Paper No. 12

For: Method for Removing a Coating from a Substrate,
And Related Compositions

RESPONSE AND REQUEST FOR CONTINUED EXAMINATION
UNDER 37 C.F.R §1.114

Assistant Director of Patents and Trademarks
United States Patent and Trademark Office
Washington, DC 20231

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Sir:

Applicants appreciate the consideration shown by the Office, as evidenced by the Advisory Action, mailed on April 22, 2003. In that Action, the Examiner maintained rejections for claims 1-22, 34-37, and 42-48, while objecting to claims 24-33 and 38-41. Applicants respectfully request reconsideration of the application by the Examiner in light of the following remarks offered as the required submittal for the accompanying Request for Continued Examination.

1. Rejection under Nagaei et al.

Claims 1, 2, 5, 6, 9, 10, 12, 13, 15, 17, 18, 19, 22, 34, and 36 remain rejected under 35 U.S.C. 102(b) as being anticipated by Nagaei et al. (Abstract of JP Patent Number

6096083). Applicants respectfully traverse this rejection because this reference does not teach, suggest, or disclose all of the limitations of the present claims under rejection.

"When the specification states the meaning that a term in the claim is intended to have, the claim is examined using that meaning, in order to achieve a complete exploration of the applicant's invention and its relation to the prior art." MPEP §2173.05(a), *citing In re Zletz*, 893 F.2d 319, 13 USPQ2d 1320 (Fed. Cir. 1989). The specification therefore may be properly used to define the scope of specific terms recited in a claim, as Applicants have done here.

As noted in previous prosecution, independent claims 1 and 34 of the present application recite in part "contacting at least one of a diffusion coating and an overlay coating." The terms "diffusion coatings" and "overlay coatings" recited in claims 1 and 34, are terms of art, and when properly read in light of the specification per the MPEP and Federal Circuit, are clearly defined to mean **two classes of advanced oxidation-resistant coatings that are deposited on substrates for environmental protection, improved thermal barrier coating life, and the like**. Both coatings are defined to be classes of "advanced oxidation-resistant coatings...required for environmental protection, as well as improved thermal barrier coating life...used on components in gas turbine hot sections." Page 1, lines 8-10. Further, "[d]iffusion coatings are formed by depositing constituent components of the coating, and reacting those components with elements from the underlying substrate, to form the coating by high temperature diffusion," while "overlay coatings are generally deposited intact, without reaction with the underlying substrate." Page 1, lines 18-21.

In the present Advisory Action, the Examiner remarks, "Oxidation of aluminum forms a diffusion coating, hence the aluminum powder in Nagaei et al." The Examiner is undoubtedly referring to the reference in Nagaei et al. to a "passive layer", which in this reference is formed, if at all, as an unwanted by-product of an annealing treatment, and is thus subsequently removed by the described washing solution.

The passive layer of Nagaei et al. does not teach, suggest, or disclose a "diffusion coating" as that term is defined for use in the present application. Applicants concede that in certain surface engineering processes, such as anodizing, a thick layer of aluminum oxide is grown on an aluminum substrate for the purpose of protecting aluminum substrates from environmental degradation. However, an anodized layer is not being addressed in Nagaei et

al. Those skilled in the art recognize that a "passive layer" cannot be construed to be a diffusion coating of the present application: an "**advanced oxidation-resistant coating that is deposited on substrates for environmental protection, improved thermal barrier coating life, and the like.**" A passive layer is recognized in the art to be extremely thin, generally on the order of an atomic monolayer or so, and is formed upon exposure of the surface to the atmosphere. A "diffusion coating" of the present application, on the other hand, as a coating grown on a substrate for environmental protection, has a thickness several orders of magnitude larger than a passive layer; according to page 4 of the present specification, an exemplary thickness range for a diffusion coating is from about 5 microns to about 125 microns. Furthermore, Nagaei's passive layer is not "**deposited on substrates for environmental protection, improved thermal barrier coating life, and the like.**" It is merely the by-product of heating the aluminum during annealing, and is removed by the wash before the part ever sees service.

The Examiner goes on to state, "grease and oil are materials used for environmental protection and thermal barrier coatings." Applicants respectfully disagree with this statement. Oil and grease are not "**advanced oxidation-resistant coatings deposited on substrates for environmental protection, improved thermal barrier coating life, and the like,**" because, as organic coatings, they are susceptible to burning when exposed to harsh oxidative environments of the type experienced by diffusion and overlay coatings of the present application. The adhesion of oil and grease to the substrate is poor, and no one skilled in the art understands such layers to provide environmental protection comparable to an overlay or a diffusion coating as those terms are defined in the present application. Moreover, prior to depositing thermal barrier coatings on substrates, the substrates are carefully de-greased to ensure good adhesion between the coating and the substrate. Therefore, these materials have no place in the improvement of thermal barrier coating life.

Because of the large practical differences between Nagai et al.'s "passive layer" and the "diffusion coating" recited in claims 1 and 34 of the present application, differences which would be quite apparent to one skilled in the art, Applicants respectfully submit that these independent claims and their dependent claims dependent claims 2, 5, 6, 9, 10, 12, 13, 15, 17, 18, 19, 22 and 36 are patentably distinct from Nagaei et al.

2. Rejection under Nagaei et al. in view of Matsukawa

Claims 3, 4, 11, 14, 16, 20, 21, 35, 37, 42 to 48 were rejected under 35 U.S.C. 103(a) as being unpatentable over Nagaei et al. (JP Patent Number 56096083) in view of Matsukawa (US Patent Number 5962145). Applicants respectfully traverse this rejection.

Applicants maintain their contention that the cited combination of references is improper because the proposed modification of the non-etching layer removal process of Nagaei et al. through the use of Matsukawa's etching and layer deposition process would clearly render the process of Nagaei et al. unsatisfactory for its intended purpose of removing passive layers without etching aluminum, because Matsukawa describes that aluminum is etched and a passive layer is deposited, while Nagaei et al. state that a passive layer is removed and aluminum is not etched.

The Examiner remarks, "Matsukawa discloses an in-suti [sic] etching of an overlay film, which depending on concentration also etches the aluminum substrate (col. 3 lines 38 – 54)." Applicants respectfully submit that the Examiner's reading of Matsukawa is not correct. The purpose of the process in Matsukawa is to form a protective film. During the process, there are two competing reactions that occur: aluminum etching and film formation. The concentration of species in Matsukawa's process is set to achieve a balance between these two competing reactions. When acid concentration is too low, there is very little etching, but when this concentration is too high, the etching reaction proceeds too swiftly; either one of these situations is undesirable to the formation of the film. Col. 3, lines 44-51. The aluminum itself must be etched for Matsukawa's process to work effectively, and, contrary to the Examiner's apparent understanding, there is no coating that is etched.

Nagaei et al. call for the removal of film and avoiding the etching of aluminum. This is the exact opposite process of Matsukawa, where a film is deposited and the aluminum is etched. The two references therefore cannot be properly combined to create a *prima facie* case of obviousness.

Applicants hereby incorporate by reference their arguments against these references stated in previous prosecution, and respectfully request reconsideration of all claims rejected under these references.

3. Rejection under Nagaei et al. in view of O'Brien

Claims 7 and 8 were rejected under 35 U.S.C. 103(a) as being unpatentable over Nagaei et al. (JP Patent Number 56096083) in view of O'Brien (US Patent Number

5,817,182). Applicants respectfully submit that because these claims depend from claim 1, which Applicants believe to be allowable for the reasons described above, claims 7 and 8 are allowable over the cited references. Applicants respectfully request reconsideration of this rejection.

4. Allowable Claims

Applicants appreciatively acknowledge the Examiner's statement as to the allowability of claims 24-33 and 38-41. Applicants respectfully request reconsideration of the objection to these claims, as Applicants believe the claims from which they depend are allowable for the reasons described herein.

In light of the remarks presented herein, Applicants submit that the case is in condition for immediate allowance and respectfully request such action. If, however, any issues remain unresolved, the Examiner is invited to telephone the undersigned at the number provided below.

Respectfully submitted,



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Schenectady, New York
29 April 2003